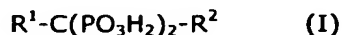


CLAIMS

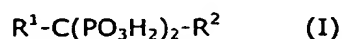
1. Use of a bisphosphonic acid derivative, or a pharmaceutically acceptable salt or hydrate thereof, for the preparation of a medicament for the treatment of calcium pyrophosphate deposition disease (CPDD) in a mammal.

- 5 2. The use according to claim 1, wherein the bisphosphonic acid derivative is of the formula I



wherein R^1 and R^2 may be independently selected from hydrogen, halogen, COOH, optionally substituted C_{1-12} -alkyl, optionally substituted aryl, optionally substituted C_{3-9} -cycloalkyl, optionally substituted heterocyclyl, optionally substituted heteroaryl, optionally substituted C_{1-12} -alkyl-aryl, optionally substituted C_{1-12} -alkyl- C_{3-9} -cycloalkyl, optionally substituted C_{1-12} -alkyl-heteroaryl, heteroaryl, heterocyclyl, optionally substituted C_{1-12} -alkyl-heterocyclyl, amino, optionally substituted C_{1-12} -alkyl-amino, optionally substituted amino- C_{1-12} -alkyl, optionally substituted amino- C_{3-9} -cycloalkyl, optionally substituted C_{1-12} -alkyl-halide, optionally substituted C_{1-12} -alkyl-OH, optionally substituted C_{1-12} -alkyl-SH, alkoxy, optionally substituted C_{1-12} -alkyl-O-alkyl, C_{1-12} -alkyl-S-alkyl, optionally substituted C_{1-12} -alkyl-COOH, and optionally substituted C_{1-12} -alkyl- PO_3H_2 , or a pharmaceutically acceptable salt or hydrate thereof.

- 20 3. The use according to claim 2, wherein the bisphosphonic acid derivative of the formula I



or a pharmaceutically acceptable salt or hydrate thereof,

- 25 wherein R^1 is selected from hydrogen and C_{1-12} -alkyl, and R^2 is selected from hydroxy, amino, $-CH_2COOH$, $-CH_2PO_3H_2$ and $-CH_2CH_2PO_3H_2$.

4. The use according to claim 1, wherein the pharmaceutically acceptable salt is the mono-, di-, tri-, or tetrasodium salt.

30

5. The use according to any one of the preceding claims, wherein the bisphosphonic acid derivative is ethane-1-hydroxy-1,1-bisphosphonic acid (EHDP).

- 35 6. The use according to any one of claims 1 to 4, wherein the bisphosphonic acid derivative is methanediolbisphosphonic acid.

7. The use according to claim 1 to 4, wherein the bisphosphonic acid derivative is ethane-1-amino-1,1-bisphosphonic acid.

5 8. The use according to any of the preceding claims for the treatment of CPDD in hyaline cartilage.

9. The use according to any one of claims 1 to 7 for the treatment of CPDD in the fibrocartilage in the meniscus of the knee.

10

10. The use according to any one of claims 1 to 7 for the treatment of CPDD in the annulus fibrosus of the intervertebral disc.

11. The use according to any one of claims 1 to 7 for the treatment of CPDD in synovial
15 fluid.

12. The use according to any of any one of claims 1 to 7 for the treatment of CPDD in the synovium and tendon insertions.

20 13. The use according to any one of claims 1 to 7, wherein the CPDD is in the articular cartilage.

14. The use according to any of the preceding claims wherein the calcium pyrophosphate is of the form selected from the group consisting of triclinic or monoclinic.

25

15. The use according to any one of the preceding claims wherein medicament comprises the bisphosphonic acid derivative in an amount so as to achieve a concentration 0.1 to 200 μM .

30 16. The use according to any one of the preceding claims wherein medicament comprises 5-2000 mg of the bisphosphonic acid derivative.

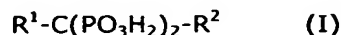
17. The use according to any one of the preceding claims wherein the treatment is prophylactic.

35

18. Use of a bisphosphonic acid derivative, or a pharmaceutically acceptable salt or hydrate thereof, for the manufacture of a dental filling or medicament for the prevention or treatment of secondary caries.

19. Use of a bisphosphonic acid derivative, or a pharmaceutically acceptable salt or hydrate thereof, for the manufacture of a dental filling or medicament for the treatment of a mammal with primary caries.

- 5 20. The use according to any one of claims 18 to 19, wherein the bisphosphonic acid derivative is of the formula I



wherein R^1 and R^2 may be independently selected from hydrogen, halogen, COOH,

- 10 optionally substituted C_{1-12} -alkyl, optionally substituted aryl, optionally substituted C_{3-9} -cycloalkyl, optionally substituted heterocyclyl, optionally substituted heteroaryl, optionally substituted C_{1-12} -alkyl-aryl, optionally substituted C_{1-12} -alkyl- C_{3-9} -cycloalkyl, optionally substituted C_{1-12} -alkyl-heteroaryl, heteroaryl, heterocyclyl, optionally substituted C_{1-12} -alkyl-heterocyclyl, amino, optionally substituted C_{1-12} -alkyl-amino, optionally substituted
15 amino- C_{1-12} -alkyl, optionally substituted amino- C_{3-9} -cycloalkyl, optionally substituted C_{1-12} -alkyl-halide, optionally substituted C_{1-12} -alkyl-OH, optionally substituted C_{1-12} -alkyl-SH, alkoxy, optionally substituted C_{1-12} -alkyl-O-alkyl, C_{1-12} -alkyl-S-alkyl, optionally substituted C_{1-12} -alkyl-COOH, and optionally substituted C_{1-12} -alkyl- PO_3H_2 ,
or a pharmaceutically acceptable salt or hydrate thereof.

20

21. The use according to claim 18, wherein the pharmaceutically acceptable salt is the mono-, di-, tri-, or tetrasodium salt.

22. The use according to claim 18 or 21, wherein the bisphosphonic acid derivative is
25 methanhydroxybisphosphonic acid.

23. The use according to claim 18 or 21, wherein the bisphosphonic acid derivative is ethane-1-amino-1,1-bisphosphonic acid.

- 30 24. The use according to claim 18, wherein the secondary caries is at the interface between the natural dental material (enamel, dentine, cementum and root material) and the filling material.

25. The use according to claim 24, wherein the filling material is amalgam or plastic.

35

26. The use according to claim 18, wherein the medicament is in the form of a depot included in a sealing material.

27. The use according to claim 18, wherein the medicament further comprises etidronate, pamidronate, alendronate, tiludronate, risedronate, zoledronic acid, clodronic acid, ibandronic acid, neridronate, olpadronate, incadronate, 1-Hydroxy-3-(1-pyrrolidinyl)propylidene]bisphosphonate, or [1-Hydroxy-2-imidazo-(1,2a)pyridin-3-ylethylidene]bisphosphonate.

28. The use according to claim 1, wherein the medicament further comprises etidronate, pamidronate, alendronate, tiludronate, risedronate, zoledronic acid, clodronic acid, ibandronic acid, neridronate, olpadronate, incadronate, 1-Hydroxy-3-(1-pyrrolidinyl)propylidene]bisphosphonate, or [1-Hydroxy-2-imidazo-(1,2a)pyridin-3-ylethylidene]bisphosphonate.

29. Use of etidronate, pamidronate, alendronate, tiludronate, risedronate, zoledronic acid, clodronic acid, ibandronic acid, neridronate, olpadronate, incadronate, 1-Hydroxy-3-(1-pyrrolidinyl)propylidene]bisphosphonate, or [1-Hydroxy-2-imidazo-(1,2a)pyridin-3-ylethylidene]bisphosphonate for the preparation of a medicament for the treatment of calcium pyrophosphate deposition disease (CPDD) in a mammal.

30. Use of etidronate, pamidronate, alendronate, tiludronate, risedronate, zoledronic acid, clodronic acid, ibandronic acid, neridronate, olpadronate, incadronate, 1-Hydroxy-3-(1-pyrrolidinyl)propylidene]bisphosphonate, or [1-Hydroxy-2-imidazo-(1,2a)pyridin-3-ylethylidene]bisphosphonate for the preparation of a medicament for the prevention or treatment of secondary caries.

31. The use according to any one of claims 18 to 30, wherein the filling or medicament comprises the bisphosphonate in a concentration of 0.1 to 50 M.

32. A composition for the delaying the deposition of calcium pyrophosphate depots in hyaline cartilage, the fibrocartilage in the meniscus of the knee, the annulus fibrosus of the intervertebral disc, the synovial fluid, or the synovium and tendon insertions, comprising bisphosphonic acid derivative or a pharmaceutically acceptable salt or hydrate thereof.

33. A composition for the treatment or prevention of secondary caries comprising a bisphosphonic acid derivative or a pharmaceutically acceptable salt or hydrate thereof.

34. A composition for the filling of a dental carie comprising a bisphosphonic acid derivative or a pharmaceutically acceptable salt or hydrate thereof.